

**BOARD OF COUNTY COMMISSIONERS  
AGENDA ITEM SUMMARY**

MEETING DATE: 04/17/03

DIVISION: COUNTY ADMINISTRATOR

BULK ITEM: No

DEPARTMENT: AIRPORTS

AGENDA ITEM WORDING: Presentation by URS of the Runway Safety Area (RSA) Feasibility Study for Key West International Airport.

ITEM BACKGROUND: Pursuant to FAA order 5200.8 and direction from the Airports District Office, the RSA Feasibility Study was commissioned. Please note that this study has a short and concise (2 and a half pages) executive summary starting on page 1 of the document. Also please be advised that as per the Board direction from the April 2002 BOCC meeting in Key West, this study only addresses the Runway Safety Area, not any runway expansion or additional runway. The need for additional runway is discussed in the Master Plan presentation, which follows this item on the agenda.

PREVIOUS RELEVANT BOCC ACTION: The BOCC approved the URS Professional Service Order (PSO) for this study on 9/18/02.

STAFF RECOMMENDATION: Approval to submit the study to the FAA. As we predicted in our own RSA study, (reviewed and approved by the BOCC on 4/18/01) the cost of the environmental mitigation is extremely high. Please review the study (or at least the executive summary), listen to the presentation, and allow us to present it to the FAA with any modifications or suggestions from the Board.

TOTAL COST: N/A

BUDGETED: N/A

COST TO COUNTY: N/A

REVENUE PRODUCING: N/A


AMOUNT PER MONTH/YEAR: N/A

APPROVED BY: County Attorney N/A

OMB/Purchasing N/A

Risk Management N/A

DIRECTOR APPROVAL



Peter J. Horton

DOCUMENTATION: Included X

To Follow

Not Required

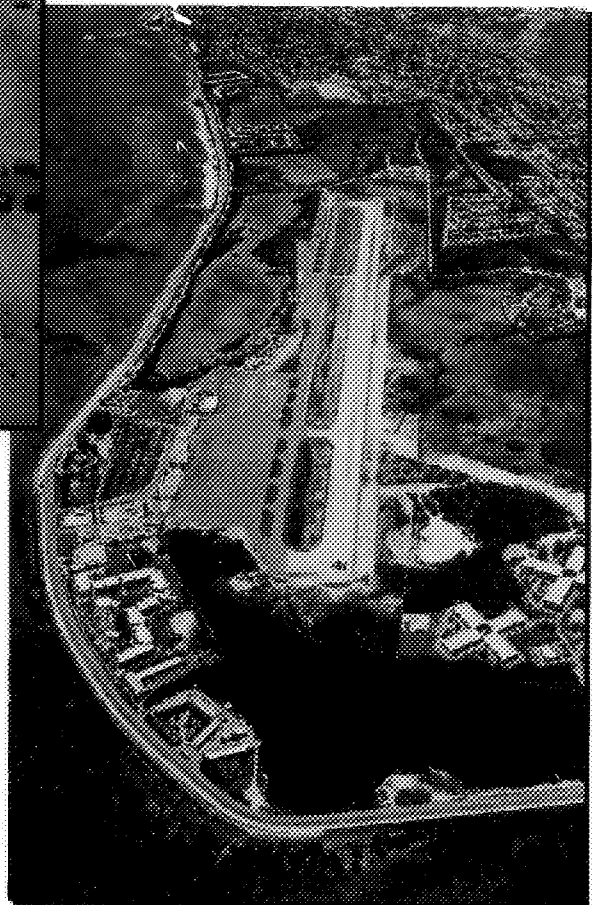
AGENDA ITEM #



DISPOSITION: \_\_\_\_\_

# KEY WEST INTERNATIONAL AIRPORT

## RUNWAY SAFETY AREA FEASIBILITY STUDY



Prepared for:  
Monroe County



Prepared by:

**URS**

March 2003

# **RUNWAY SAFETY AREA FEASIBILITY STUDY**

**Key West International Airport  
Monroe County, Florida**

**Prepared for:**

**Monroe County Board of County Commissioners  
and the  
Federal Aviation Administration**

**Prepared by:**

**URS**

**URS Corporation  
Miami, Florida  
Tampa, Florida**

**March 2003**

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## 10 EXECUTIVE SUMMARY

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## 1.0 EXECUTIVE SUMMARY

The Monroe County Board of County Commissioners (County) and the Federal Aviation Administration (FAA) are evaluating the practicability of providing a standard Runway Safety Area (RSA) for Runway 9/27 at the Key West International Airport (KWIA). The RSA is a graded and grassed area around the runway pavement that provides support for an aircraft in the event of an excursion from the runway without causing structural damage to the aircraft or *injury to their occupants*.

The existing RSA does not meet FAA requirements and design standards. The existing RSA is approximately 300 feet wide along the length of the runway. The existing RSA extends approximately 110 feet beyond the end of Runway 9. Beyond the end of Runway 27 end, the existing RSA length varies from 210 feet to 400 feet. The required RSA dimensions, based on current operations, are 500 feet wide by 1,000 feet beyond each runway end.

FAA regulations require that the County study how it can meet the RSA design standards. The FAA will then evaluate and make a determination of the practicability of providing a standard RSA at the airport.

The purpose of this study is to provide information for the Monroe County Board of County Commissioners and the Federal Aviation Administration to determine the environmental feasibility and practicability of providing a standard RSA at the KWIA. The study will identify potential permitting issues and identify conceptual mitigation strategies and projected costs associated with the proposed RSA development. Given the airport's physical setting, the scope of this feasibility study is focused on the potential to obtain necessary wetland-related environmental permits and the probable magnitude and cost of wetland mitigation. The feasibility study includes coordination with select Federal and state agencies to identify potential permit issues and probable mitigation requirements.

A summary of the findings and conclusion is presented below:

### ***Development of a Conceptual Mitigation Strategy***

- The development of conceptual mitigation strategies first identified potential direct impacts to wetland resources at the airport resulting from the construction of the standard RSA. The impacts were discussed with regulatory and commenting agencies through a series of meetings and site visits to identify potential permit issues and probable mitigation requirements.
- A list of potential mitigation sites was prepared through the review of aerial photographs and maps. Coordination with local resource agency representatives and organizations was then conducted to identify additional potential mitigation opportunities. A field reconnaissance was also conducted to review accessible sites and identify additional sites.
- The list of potential mitigation projects was coordinated with regulatory and commenting agencies to further discuss issues and probable mitigation requirements. The result of this effort allowed URS to develop conceptual mitigation strategies and preliminary mitigation costs for consideration by Monroe County and the Federal Aviation Administration.

### ***RSA Project Impact Issues***

- The RSA project would impact substantial mangrove community and open water habitat on Key West. Approximately 24.9 acres of wetlands will be directly impacted. Salt pond habitats are considered to be a unique resource on Key West.
- For the permit application process, the regulatory and commenting agencies will require a detailed analysis of alternatives that first avoid and then minimize impacts to the wetland habitats, including consideration of a No-Action alternative.
- The regulatory and commenting agencies indicated that cumulative and secondary impacts will likely be significant issues to be addressed during any subsequent NEPA environmental studies and permit application process.
- The RSA project and proposed mitigation will require the removal of the abandoned bunker located west of the runway. This action will require approval from the State Historic Preservation Officer.
- Potential impacts to protected species, wildlife, Essential Fish Habitat, and migratory birds are of concern to the regulatory and commenting agencies.
- Potential impacts to water quality and hydrology in the salt ponds are of concern to the regulatory and commenting agencies.
- Federal participation in the proposed RSA project will require the preparation of an Environmental Assessment or Environmental Impact Statement.

### ***Mitigation Issues***

- It is estimated that 77.8 acres of wetland creation/restoration may be required for the direct impacts of the proposed RSA project. Detailed habitat evaluations and related impact studies will provide the basis for final mitigation ratios, which could vary from the probable ratios developed for this study.
- The regulatory and commenting agencies are interested in maximizing on-site mitigation before considering off-site options. Physical constraints limit on-site opportunities. It has been determined that off-site mitigation is needed to satisfy probable mitigation requirements.
- Regulatory agencies may seek higher ratios for off-site mitigation than on-site mitigation.
- The development of a conceptual mitigation strategy found that a single site suitable to provide all of the projected mitigation is not available in the vicinity of the airport. The mitigation strategy involves a number of smaller projects located throughout the lower Keys.
- Ten mitigation sites on public land were identified. The land to the north of the airport where some mitigation is proposed is owned by the County but leased to the City of Key West. Other public-owned mitigation sites are under County or federal ownership. Agreements will be required for the County to conduct mitigation on the leased property and federal property.
- Eight mitigation sites are privately owned and would require acquisition.
- One potential mitigation site (the Habitat for Humanity site) has known environmental concerns. Additional investigation is needed to determine if the liability and costs for any hazardous material clean-up would be prohibitive.
- Eighteen sites with approximately 108 acres of wetland creation potential and 5.4 acres of wetland enhancement were identified. Mitigation on sites considered to have high and moderate potential for use would yield approximately 61.3 acres of mitigation credit toward the 77.8 acres estimated to be needed.



- Three sites considered to have low potential, primarily due to possible acquisition issues and environmental liability, would collectively have an additional 52.3 acres of wetland creation credit potential. The North Boca Chica site, with approximately 41.5 acres of potential mitigation, would provide the best option for providing additional mitigation. However, discussions with regulatory agencies indicate that this land has been considered on other mitigation projects, but acquisition issues were not resolved.

#### ***Probable Project Costs***

- The total projected construction cost for the standard RSA at KWIA, including design and construction phase fees, is **\$9,161,200**.
- Land acquisition costs for the mitigation sites were developed from the Monroe County Property Appraiser's Office records, with a 30 percent increase added to the County's Just Valuation estimates. Detailed appraisals may indicate fair market values higher than estimated in this study. The acquisition costs include estimated incidental costs (i.e., appraisals, surveys, etc.) but not potential additional costs for negotiated settlements or potential imminent domain acquisitions.
- Mitigation cost estimates were based on conceptual excavation, clearing and grubbing, and re-vegetation requirements for each mitigation project. The costs include consideration of potential design, permitting and construction phase fees.
- The total projected cost of all the mitigation projects identified is **\$14,376,400**.
- The total projected cost of the RSA construction, land acquisition, and mitigation projects is **\$23,537,600**.

## 2.0 INTRODUCTION

The Monroe County Board of County Commissioners (County) and the Federal Aviation Administration (FAA) are evaluating the feasibility and practicability of providing a standard Runway Safety Area (RSA) for Runway 9/27 at Key West International Airport (KWIA). The RSA is an improved area around the runway that provides support for an aircraft without causing structural damage to the aircraft or *injury to their occupants* in the event of an excursion from the paved runway surface. The existing RSA does not meet FAA requirements and design standards due to the existence of salt ponds and mangroves beyond each end and along the northern edge of the runway.

The RSA is an integral part of the runway environment, and numerous instances at other airports involving runway excursions, including incidents with fatalities, underscore the importance of having an adequate RSA. The stable surface helps an aircraft come to a stop while minimizing structural damage and the potential for injury or loss of life in the event of a runway excursion. Of importance is the RSA provided at each end of the runway, where most excursions tend to occur. The RSA also provides a surface around the runway suitable for the movement of firefighting and emergency vehicles.

### 3 0 PURPOSE AND SCOPE OF THE STUDY

### 3.0 PURPOSE AND SCOPE OF THE STUDY

The purpose of the study is to provide information for the Monroe County Board of County Commissioners and the FAA to make a determination of the practicability of providing a standard RSA at KWIA. Safety is FAA's highest priority in the aviation system, and a determination of practicability is based primarily on whether the provision of a standard RSA is either technically feasible and/or financially feasible. If the FAA's decision is that a standard RSA is not practicable, then an evaluation of other options to provide an additional RSA will be conducted.

The intent of this study is to identify potential permitting issues and identify conceptual mitigation strategies and costs associated with the proposed RSA development. Given the airport's physical setting, the scope of this feasibility study is focused on the potential to obtain necessary wetland-related environmental permits and the probable magnitude and cost of mitigation. The feasibility study includes coordination with select Federal and state agencies to identify potential permit issues and probable mitigation requirements.

The environmental resources of concern in this study will be generally limited to the natural environment (i.e., mangroves, salt ponds, wetlands, and protected species). The resources will be identified and quantified generally through available aerial photography and the understanding of the site and from project personnel having field experience at the airport and in the lower Keys area. Impacts will generally be quantified by the area (acreage) impacted.

The environmental analysis conducted for this study does not include detailed biological or habitat studies, surveys for protected species, water quality studies, cultural resource assessments, and site-specific wetland delineation and surveys, or preparation of detailed mitigation plans. The environmental analysis does not include consideration of air quality impacts, aircraft noise impacts, social impacts, or economic impacts. These are customarily addressed in a formal Environmental Assessment or Environmental Impact Statement.

In the case that the County and FAA decide to implement a standard RSA, the County's request for federal assistance to improve the RSA will require a detailed review of environmental impacts under the National Environmental Policy Act (NEPA) of 1969. Reasonable alternatives, including a No-Action Alternative, would be thoroughly examined in the NEPA review process. As such, this feasibility study does not provide an impact analysis on whether the proposed standard RSA improvement would trigger any thresholds of significance per FAA guidance (FAA Orders 5050.4A and 1050.1D) or other applicable laws and regulations.

## 40 AIRPORT INFORMATION

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## 4.0 AIRPORT INFORMATION

### 4.1 Key West International Airport

KWIA provides airfield, terminal, and support facilities for scheduled commercial flights, air charter/taxi operations, air cargo, and general aviation operations. The location of the airport is shown in Figure 4.1-1, and the layout of airfield facilities are depicted in Figure 4.1-2.

KWIA is a critical component of the transportation network serving south Monroe County and the City of Key West. The community relies on aviation for the shipment of goods and major means of travel. Seventy percent of passenger traffic at KWIA is tourism-related (KWIA Draft Master Plan Update, 2003). The total annual economic impact of an airport to its community is a combination of direct and indirect impacts associated with the provision and use of aviation services as well as the multiplier effect associated with the re-spending of money in the area. The total annual economic impact of KWIA is \$806 million, of which \$260 million is paid in earnings to 12,288 jobs (Florida Aviation System Plan, 2000).

### 4.2 Airport Activity

The number of aircraft operations (take-offs and landing) and annual passenger enplanements for 2001, 2011, and 2020, as published in the current FAA Terminal Area Forecast, are presented in Table 4.2-1. As shown, the level of aircraft operations and the number of commercial passengers are expected to increase substantially over the next 20-year period. During peak months in 2001, approximately 349 aircraft operations were generated daily at the airport. Average daily operations during peak months are expected to reach 419 by 2021 (URS Corporation, 2003).

**TABLE 4.2-1  
AIRCRAFT OPERATIONS AND ENPLANEMENTS**

Year	Annual Aircraft Operations	Operations Increase (%)	Annual Commercial Passenger Enplanements	Enplanements Increase (%)
2001	97,517	--	280,376	--
2011	102,413	5.0	342,493	22.2
2020	111,413	8.8	414,372	21.0

Source: Federal Aviation Administration, *Terminal Area Forecast*, 2003.

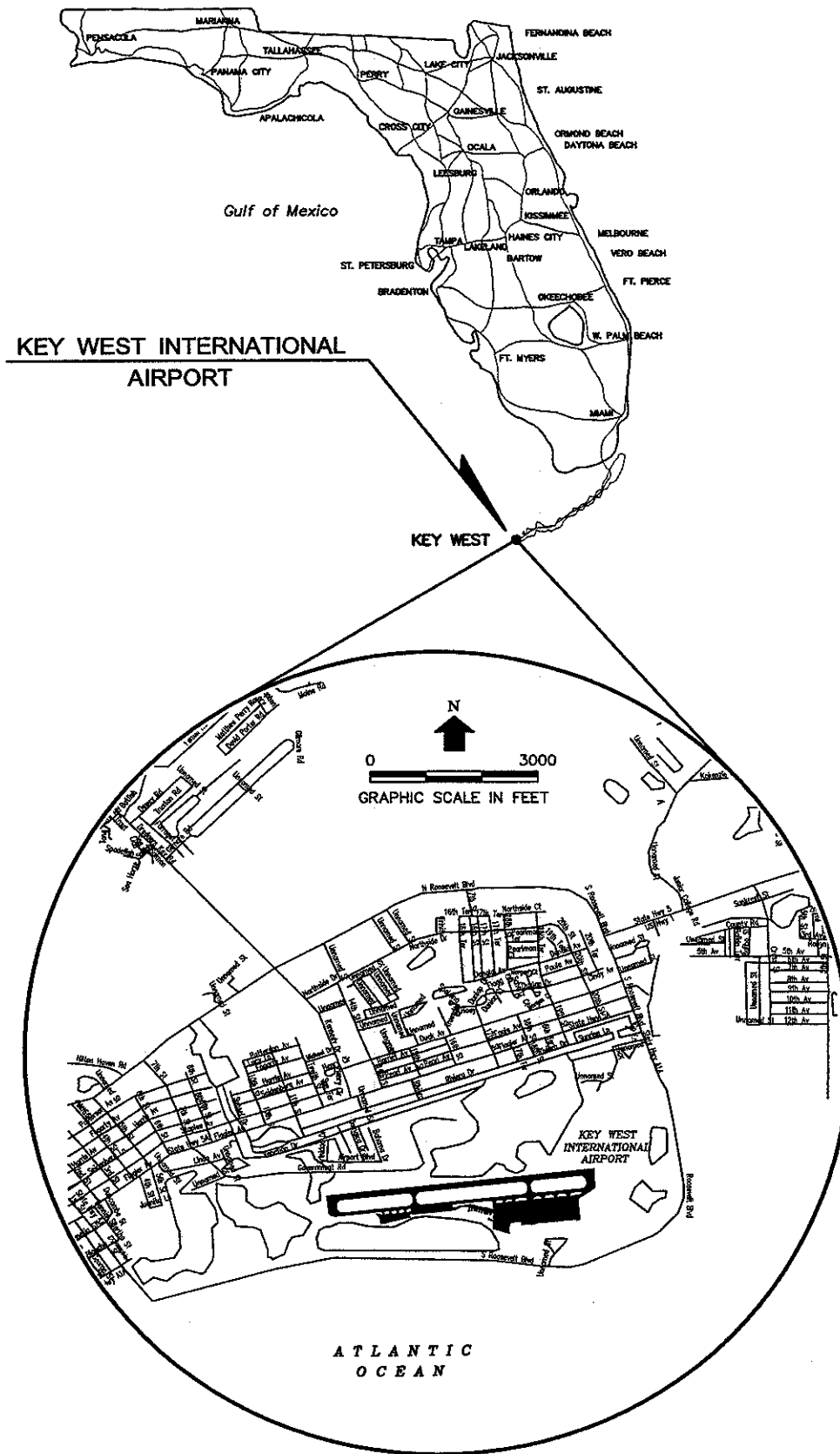
A variety of commercial and general aviation aircraft operate at KWIA. Commercial air carrier aircraft operating at the airport include small commuter aircraft and larger aircraft, such as the turbo-prop ATR-72 and the turbine-powered regional jet (CRJ-700). These turbine aircraft are more demanding (e.g., approach speed) and can carry 50 to 70 passengers. A wide variety of general aviation aircraft, including high-performance business jets, also use the airport on a regular basis.



**CRJ-700 Regional Jet at KWIA**

#### **4.3 Airport Master Plan Update**

Monroe County, with assistance from the FAA, is currently in the process of updating the Airport Master Plan for KWIA. The Master Plan has been completed and will be submitted to the County for their approval in April 2003. The Master Plan will provide a long-term plan for airport improvements necessary to meet future aviation demand. The airport Master Plan was previously updated in 1986 and revised in August 1992.



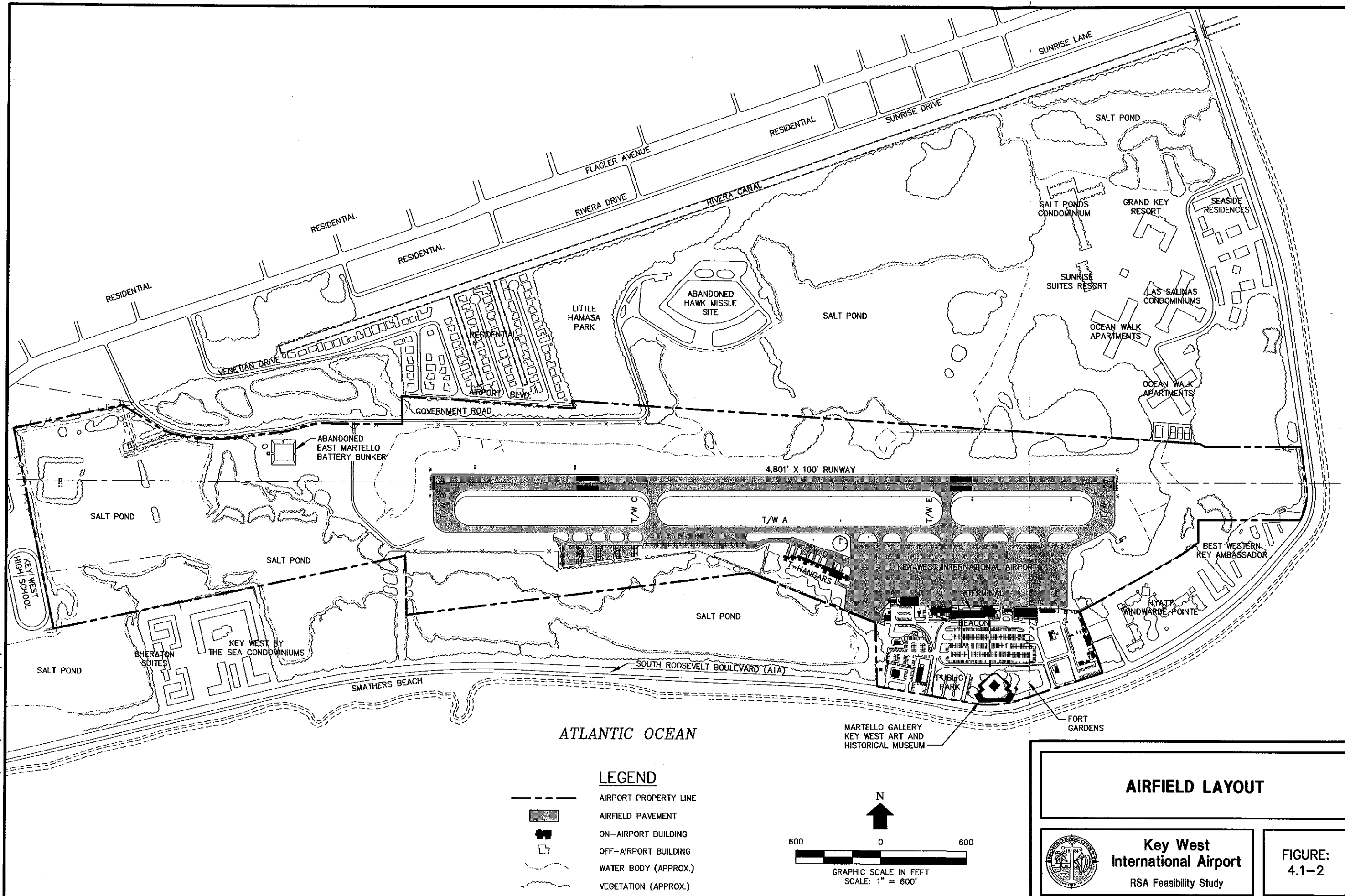
**Key West  
International Airport**  
RSA Feasibility Study

**VICINITY MAP**

**FIGURE:  
4.1-1**



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### AIRFIELD LAYOUT

**Key West International Airport**  
RSA Feasibility Study

**FIGURE: 4.1-2**

## **50 KWIA RUNWAY SAFETY AREA REQUIREMENTS**

## 5.0 KWIA RUNWAY SAFETY AREA REQUIREMENTS

### 5.1 RSA Definition and Purpose

An RSA is defined in the FAA Advisory Circular (AC) 150/5300-13, *Airport Design*, as:

"A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway."

The rationale for the RSA is to provide a stable surface around the paved runway that will enhance the safety of passengers by supporting an aircraft which may depart the runway. An additional safety-related purpose is to provide greater accessibility for firefighting and emergency rescue vehicles during such incidents.

### 5.2 RSA Design Standards

RSA dimensions are dependent on the airport's Airport Reference Code (ARC). The ARC for an airport is based on the approach speed and wingspan of Critical Aircraft operating at the airport. Airplanes operating at higher speeds require increased safety allowances for speed and reduced decision time. As such, the RSA requirements increase as the ARC increases.

**KWIA RSA Requirements** - The ARC for KWIA is C-III. This is based on Approach Category C (CRJ-700 Regional Jet) and Airplane Design Group III (Dash 8). The required RSA dimensions for the C-III ARC is 500 feet wide by 1,000 feet beyond each runway end. Appendix A contains the applicable reference table from FAA AC 150/5300-13, *Airport Design*. The initial planning criteria and agency coordination conducted for this study referenced a D-III ARC based on the CRJ-200 Regional Jet that was in service at KWIA in 2002. The planning criteria for the Airport Master Plan Update was subsequently revised to ARC C-III since the CRJ-200 no longer serves the airport. The change in the ARC does not affect the RSA dimensions or requirements for this study as they are the same for both Approach Category C and D aircraft.

In the past, the FAA could issue a Modification of Standards if an RSA did not meet dimensional standards as long as an acceptable level of safety was provided. FAA AC 150/5300-13, *Airport Design*, Change 7, dated October 1, 2002, states that Modification of Standards no longer apply to Runway Safety Areas.

**RSA Construction Requirements** - FAA AC 150/5300-13, *Airport Design*, requires that the RSA be:

1. Cleared and graded and have no potentially hazardous ruts, humps, depressions, or other surface variations;
2. Drained to prevent water accumulation;

3. Capable, under dry conditions, to support equipment (including rescue and fire fighting vehicles) and the occasional passage of aircraft without causing structural damage to the aircraft; and
4. Free of objects, except for those required by function.

### 5.3 Existing and Proposed RSA Dimensions

The existing RSA at the airport does not meet the dimensional requirements for the current C-III ARC. The existing RSA and the required RSA are shown in Figures 5.3-1, 5.3-2, and 5.3-3. Table 5.3-1 summarizes the dimensions of the required, existing, and proposed RSA. It is important to note that the RSA improvement project considered in this feasibility study is required for current airport operations and are needed to meet current safety standards.

**TABLE 5.3-1  
RUNWAY SAFETY AREA DIMENSIONS – EXISTING AND PROPOSED**

RSA Dimensions	Required (ARC C-III)	Existing	Proposed
Width Along Runway	500'	300' +/- (varies)	500'
Runway 9 End	500' W x 1,000' L	300' W x 110' L +/-	500' W x 1,000' L
Runway 27 End	500' W x 1,000' L	300' W x 210' - 400' L +/-	500' W x 1,000' L

Source: FAA AC 150/5300-13; URS Corporation, 2002.

### 5.4 FAA RSA Implementation

**Design** - FAA AC 150/5300-13, *Airport Design*, specifies the dimensions, gradients, and particulars of a RSA as applied to different ARC classifications.

**Certification** - Federal Aviation Regulations (FAR) Part 139, *Certification and Operations: Land Airports Serving Certain Air Carriers*, provides certification requirements for airports with scheduled commercial passenger service (14 CFR 139). KWIA currently holds a Part 139 certificate and must comply with the requirements of the certification program.

FAR Part 139.309 requires that each certificate holder provide and maintain safety areas for runways and taxiways. In the case of KWIA, the existing RSA configuration has been grandfathered by the FAA; however, a planned runway resurfacing project requires that airport studies now meet RSA standards. FAR Part 139 references the *Airport Design* circular for the configuration and maintenance of safety areas.

**RSA Program** - The FAA has aggressively restated its long-standing policy to bring safety areas up to standard by the issuance of FAA Order 5200.8, *Runway Safety Area Program*, in October 1999. The order establishes procedures to ensure that all RSAs at federally obligated airports and Part 139 certificated airports conform to the standards in FAA AC 150/5300-13, to the extent practicable. The program calls for an inventory of RSAs at each airport and a determination of compliance for each RSA.